REMARKS

In accordance with the foregoing, claim 1, 5, 7, 11, 17, 22 and 28 have been amended. Claims 6, 25 and 34 have been cancelled. Claims 1-5, 7-24, 26-33 and 35-36 are pending and under consideration.

REQUEST FOR CONSIDERATION OF INFORMATION DISCLOSURE STATEMENT:

Applicant respectfully requests consideration of the Information Disclosure Statement filed April 25, 2005.

REJECTION UNDER 35 U.S.C. §102:

Claims 1-5, 7-24, 26-33 and 35-36 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kamiguchi et al., European Patent Number 1,044,781 (hereinafter "Kamiguchi"). This rejection is traversed and reconsideration is requested.

This rejection is respectfully traversed because Kamiguchi does not teach or suggest:

> obtaining an interdependency relation of the resin pressure with respect to the resin temperature and an injection velocity or a flow rate of resin, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin, **wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.**

Kamiguchi discloses "an injection molding machine further including storage means for storing actually measured injection pressure curves data in air shots performed at a plurality of levels of resin temperature and injection velocities for the same shape of the cylinder and that of the nozzle of the molding machine and the same resin, and wherein, in the means for obtaining an injection pressure curve in the air shot, **the actually measured injection pressure curves data stored in the storage means are interpolated, so that an injection pressure curve in an air shot with respect to a resin temperature and an injection velocity of the molding conditions in the molding is formed**" (Kamiguchi, page 4, paragraph 24). In other words, Kamiguchi discloses **estimating** the injection pressure curve based upon an **interpolation** of sampled data points. Interpolation with a limited number of sample points can lead to an inaccurate estimation of the injection pressure. Kamiguchi acknowledges the problem of interpolation by disclosing that "the larger number of the levels of the known injection velocities

and resin temperatures, the more accurate the approximation is" (Kamiguchi, page 7, lines 56-57). However, Kamiguchi fails to teach or suggest any other methods for "obtaining an interdependency relation of the resin pressure with respect to the resin temperature and an injection velocity or a flow rate of resin, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin", as recited, for example, in claim 5.

Further, the injection pressure curve in the air shot referred to above (Kamiguchi, page 4, paragraph 24) is in fact a curve representing variation of the injection pressure as a function of time, which does not indicate the interdependency of the resin pressure with respect to the resin temperature and the injection velocity (or flow rate) of resin not focusing on time as a parameter.

Therefore, because Kamiguchi fails to teach or suggest the above disclosed feature of claim 5, the applicant respectfully requests reconsideration of claim 5 under 35 U.S.C. § 102(b). Furthermore, independent claims 1, 11, 17, 22 and 28 comprise:

> obtaining at least one of a degree of resin-temperature dependency of a resin pressure and a degree of velocity or flow-rate dependency of a resin pressure, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of each of said injections of resin, wherein the degree of resin-temperature dependency of a resin pressure obtains a dependency relation according to an exponential function of the resin temperature and/or the degree of velocity or flow-rate dependency of a resin pressure obtains a dependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin (claim 1);

> automatically obtaining an interdependency relation of the resin pressure with respect to the resin temperature and the injection velocity or flow rate of resin based on combinations of the data of the injection pressure, the injection velocity and the resin temperature in the injections, wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 11);

> analyzing means for obtaining at least one of a degree of resin temperature dependency of the resin pressure and a degree of the injection velocity or flow rate dependency of the resin pressure based on the detected resin pressure, the injection velocity, and the resin temperature, at one of set screw positions and at set points in time elapsing from a start of injection, wherein said analyzing means obtains a dependency relation according to either an equation expressing the resin pressure using a power function

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of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 17);

analyzing means for obtaining an interdependency relation between the resin pressure with respect to the resin temperature and an injection velocity or a flow rate of resin based on the detected resin pressure, the injection velocity and the resin temperature at one of set screw positions and at set points in time elapsing from a start of each injection, wherein said analyzing means obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 22);

analyzing means for analyzing interdependency relation of the resin pressure with respect to the resin temperature and the injection velocity or a flow rate of resin based on data stored in said storing means, wherein said analyzing means obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 28).

Therefore, applicants respectfully submit that independent claims 1, 11, 17, 22 and 28 patentably distinguish over the prior art.

Claims 2-4, 7-10, 12-16, 18-21, 23, 26, 27, 29-33 and 35-36 depend from one of independent claims 1, 5, 11, 17, 22 and 28, and include all the features of these claims and are therefore believed to be allowable for at least the reasons mentioned above.

Claims 1-5, 7-24, 26-33 and 35-36 were rejected under 35 U.S.C. § 102(b) as being anticipated by Nunn, U.S. Patent Number 4,850,217 (hereinafter "Nunn"). This rejection is traversed and reconsideration is requested.

This rejection is respectfully traversed because Nunn does not teach or suggest:

obtaining an interdependency relation of the resin pressure with respect to the resin temperature and an injection velocity or a flow rate of resin, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin, wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature.

Nunn discloses a method "for determining PVT constants of a thermoplastic material in an injection molding machine. The injection outlet of the molding machine barrel is blocked and a shot of material is plasticated in the barrel and then pressurized in the barrel at a certain

temperature and pressure by axially advancing the screw toward the blocked outlet. The volume of the pressurized shot is then measured by measuring the axial position of the screw. The pressurized shot is then purged and the purged shot is weighed. The specific volume of the material is calculated as the ratio of the volume of the shot divided by its weight. These steps are then repeated for a plurality of different temperatures and pressures. The **specific volumes are assembled as a function of temperature and pressure**, preferably by preparing a plurality of plots of specific volume values as a function of temperature along pressure isobars" (Nunn, column 4, lines 4-22). In other words, Nunn discloses a **dependency between volume and temperature and volume and pressure**, i.e. the change in the volume of the resin depending upon the temperature and pressure of the resin when it was injected. Furthermore, Nunn discloses "FIG. 3 is a schematic diagram showing the variation of RAM position **with time**, ram velocity **with time** and hydraulic pressure **with time** during the injection portion of a qualifying cycle" (Nunn column 4, lines 32-35). However Nunn fails to teach or suggest "obtaining an **interdependency relation of the resin pressure with respect to the resin temperature and an injection velocity** or a flow rate of resin, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin" as recited, for example, in claim 5. Although obtaining variation of the pressure, volume, and temperature (PVT) is mentioned in Nunn, this reference fails to disclose or suggest obtaining the relationship between the resin pressure and the resin temperature excluding resin volume as a variable.

Furthermore, Nunn discloses a series of equations: "$U_2/U_1 = \exp[-E(T_2 - T_1)/(RT_2 T_1)]$ . . . $T_2 = T_1/[1 + (R/E)Ln(U_2/U_1)]$ " (Nunn, column 5, lines 17-20). Nunn further discloses "[t]he immediately preceding equation indicates that a **change in melt temperature (T_2) may be calculated from a change in viscosity**" (Nunn, column 5, lines 23-25). In other words, Nunn discloses performing 2 injections (where the viscosities of cycle 1 and cycle 2 are represented by U_1 and U_2 respectively), measuring the change in viscosity between the two injections and **calculating the change in the melt temperature from the change in viscosity.** Therefore, Nunn fails to teach or suggest "**obtaining an interdependency relation of the resin pressure with respect to the resin temperature and an injection velocity** or a flow rate of resin, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of the injections of resin, wherein said interdependency relation is obtained **according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature**" as recited, for example, from claim 5.

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Therefore, because Nunn fails to teach or suggest the above disclosed feature of claim 5, the applicant respectfully requests reconsideration of claim 5 under 35 U.S.C. § 102(b). Furthermore, independent claims 1, 11, 17, 22 and 28 comprise:

obtaining at least one of a degree of resin-temperature dependency of a resin pressure and a degree of velocity or flow-rate dependency of a resin pressure, based on either a relationship between the resin pressure and a screw position or a relationship between the resin pressure and an elapsing time from a start of each of said injections of resin, wherein the degree of resin-temperature dependency of a resin pressure obtains a dependency relation according to an exponential function of the resin temperature and/or the degree of velocity or flow-rate dependency of a resin pressure obtains a dependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin (claim 1);

automatically obtaining an interdependency relation of the resin pressure with respect to the resin temperature and the injection velocity or flow rate of resin based on combinations of the data of the injection pressure, the injection velocity and the resin temperature in the injections, wherein said interdependency relation is obtained according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 11);

analyzing means for obtaining at least one of a degree of resin temperature dependency of the resin pressure and a degree of the injection velocity or flow rate dependency of the resin pressure based on the detected resin pressure, the injection velocity, and the resin temperature, at one of set screw positions and at set points in time elapsing from a start of injection, wherein said analyzing means obtains a dependency relation according to either an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 17);

analyzing means for obtaining an interdependency relation between the resin pressure with respect to the resin temperature and an injection velocity or a flow rate of resin based on the detected resin pressure, the injection velocity and the resin temperature at one of set screw positions and at set points in time elapsing from a start of each injection, wherein said analyzing means obtains the interdependency relation according to an equation expressing the resin pressure using a power function of the injection velocity or the flow rate of resin, and an exponential function of the resin temperature (claim 22);

analyzing means for analyzing interdependency relation of the resin pressure with respect to the resin temperature and the injection velocity or a flow rate of resin based on data stored in

said storing means, wherein said analyzing means obtains the
interdependency relation according to an equation expressing the
resin pressure using a power function of the injection velocity or
the flow rate of resin, and an exponential function of the resin
temperature (claim 28).

Therefore, applicants respectfully submit that independent claims 1, 11, 17, 22 and 28
patentably distinguish over the prior art.

Claims 2-4, 7-10, 12-16, 18-21, 23, 26, 27, 29-33 and 35-36 depend from one of
independent claims 1, 5, 11, 17, 22 and 28, respectively, and include all the features of that claim
and are therefore believed to be allowable for at least the reasons mentioned above.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the
application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is
requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge
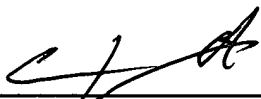the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: _8·8·2005_   By: _____
                              Christopher P. Mitchell
                              Registration No. 54,946

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501

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